California Department of Public Health – June 2016

Meningococcal Disease Quicksheet

Infectious Agent
Neisseria meningitidis, a gram-negative diplococcus bacterium carried by 5-10% of the population.

Clinical Description
Invasive disease manifests most commonly as meningitis and/or meningococcemia and may progress to purpura fulminans, shock, and death within hours of onset. Other manifestations, such as septic arthritis or orbital cellulitis, may be observed. The case fatality rate is 10% and 11-19% of surviving patients have sequelae (e.g., neurologic disability, limb loss, and hearing loss).

Mode of Transmission
Transmission occurs through contact with aerosols from the nose, throat, and mouth of colonized or infected persons. *N. meningitidis* may be carried in the nasopharynx of otherwise healthy individuals. Invasive meningococcal disease occurs primarily in individuals who are newly colonized with the organism, usually within the first few days.

Incubation Period
From 1-10 days, usually less than 4 days.

Period of Communicability
Persons with meningococcal disease are considered infectious 7 days before onset of disease until 24 hours after initiation of appropriate antibiotic therapy with the most infectious period shortly before onset until initiation of antibiotic therapy.

2015 CDC/CSTE Case Definition
Confirmed:
- Detection of *N. meningitidis*-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood or CSF), using a validated polymerase chain reaction (PCR) assay; or
- Isolation of *Neisseria meningitidis*
  - from a normally sterile body site (e.g., blood or cerebrospinal fluid, or, less commonly, synovial, pleural, or pericardial fluid), or
  - from purpuric lesions.

Probable:
- Detection of *N. meningitidis* antigen in
  - formalin-fixed tissue by immunohistochemistry (IHC); or
  - in CSF by latex agglutination.

Suspect:
- Clinical purpura fulminans in the absence of a positive blood culture; or
- Gram-negative diplococci, not yet identified, isolated from a normally sterile body site (e.g., blood or CSF).

Culture-negative suspect cases
If antibiotics have been given prior to specimen collection, sterile site cultures may be negative. Culture-negative sterile site specimens should be submitted to the CDPH Microbial Diseases Laboratory (MDL) for PCR testing, which can confirm the diagnosis. See "Laboratory Testing for Meningococcal Disease" at: http://www.cdph.ca.gov/programs/immunize/Documents/CDPHMeningococcalLabTesting.pdf

A **primary case** of meningococcal disease is one that occurs in the absence of previous known close contact with another case. A **secondary cas**e is one that occurs in a close contact of a primary case ≥24 hours after the onset of illness in the primary case. **Co-primary cases** are two or more cases that occur among a group of close contacts with onset of illness separated by <24 hours.

Case Investigation
1) Confirm that the suspected case meets the case definition and/or is highly suspected.
2) Identify and locate patient specimens. **Submit bacterial isolates or culture-negative sterile site specimens to CDPH MDL as soon as possible for serogrouping and additional testing.** See "Laboratory Testing for Meningococcal Disease" at link above for more information.
3) Confirm that appropriate antibiotics have been provided to the case. Cases treated only with penicillin need an additional antibiotic to eradicate pharyngeal carriage (see page 3 for more information).
4) Identify all persons who had close contact with case within 7 days of onset of disease in case until case has had 24 hours of effective antibiotic therapy (see definition of close contact below). Interview the case, their household members and close friends (for adolescents and young adults, close friends may be the only source of information about contacts during school or in other non-household settings).
5) Recommend antibiotic postexposure prophylaxis for close contacts as soon as possible, ideally within 24 hours of identification of the index case and up to 14 days from the last exposure.

6) Postexposure prophylaxis should be offered regardless of the meningococcal vaccination status of the contact.
7) For long-term protection, recommend meningococcal vaccines to unvaccinated close contacts who qualify for vaccine under ACIP recommendations and to unvaccinated recovered cases.
8) Meningococcal vaccine (quadrivalent ACWY or MenB vaccines) may also be considered for unvaccinated:
    - persons who are not close contacts who qualify for vaccine under ACIP recommendations to help reduce anxiety about exposure; and
    - close contacts who do not qualify for vaccine under ACIP recommendations (the risk of exposure may be longer than the short period of protection from chemoprophylaxis). Children vaccinated before the age recommended by ACIP should receive additional dose(s) of vaccine at the recommended age(s).
9) Provide close contacts with information about the signs and symptoms of meningococcal disease and ask them to self-monitor for the onset of febrile illness.
10) Alert clinicians and educate the public, as indicated.
11) Recommend evaluation of previously immunized or recurrent cases for terminal complement or other immune deficiency; some experts recommend evaluation of all recovered cases.
12) Report vaccine failures to the CDPH Immunization Branch.

Close Contact Definition

Close contacts are people who may have been exposed to the respiratory aerosols of a case in the 7 days before the onset of symptoms in the case and until the case has had 24 hours of effective antimicrobial therapy.

CDC guidance states that close contacts include anyone directly exposed to the patient's oral secretions (e.g., through kissing, endotracheal intubation, endotracheal tube management, or mouth-to-mouth resuscitation,). However, *N. meningitidis* is not commonly detected in saliva and CDPH believes that such exposures are more likely to be markers of close contact in which inhalation of respiratory aerosols from the case can occur. Direct exposure to the case's oral secretions is not necessary for transmission of *N. meningitidis* to occur.

The following persons are considered close contacts:

- Household members.
- Childcare or preschool contacts.
- Persons with unprotected exposure to the case's respiratory aerosols, e.g., via intubation, endotracheal tube management, suctioning, and mouth-to-mouth resuscitation.
- Persons who shared sleeping spaces with the case (e.g., dormitory, barracks).
- Persons with exposure to the index patient's respiratory secretions through kissing or other markers of close or intimate contact (e.g., sharing toothbrushes, eating utensils or cigarettes, cigars, or pipes). Although *N. meningitidis* is not commonly detected in saliva, these types of exposures are often used as indicators of close contact.
- Other persons who may be considered close contacts include people who are likely to have been exposed to aerosols or secretions from the case's nose, throat, or mouth (e.g., close face-to-face contact, especially if prolonged).
- Per CDC, persons sitting directly next to the index case during airline flights lasting more than 8 hours.

When there are a large number of contacts or there is difficulty reaching contacts, priority should be given to persons with prolonged or intimate contact with the case, or contact with the case shortly before onset of disease when cases are most infectious.

Expanded Chemoprophylaxis

Vaccination is the preferred control measure for serogroup B, C, W, or Y outbreaks. However, in outbreaks involving limited populations or where persons/groups at increased risk can be identified (e.g., college/university social networks, jails, daycares, residential facilities and smaller primary or secondary schools), expanding chemoprophylaxis to others beyond those identified as close contacts may be used to temporarily reduce meningococcal carriage before potential protection from vaccination can be achieved.

If expanded chemoprophylaxis is undertaken, it should be administered to all targeted persons at the same time, ideally within 24 hours. Contact CDPH for consultation if expanded chemoprophylaxis is being considered.

Mass Vaccination

Mass vaccination may be used during a suspected or confirmed meningococcal disease outbreak. The vaccine used should reflect the outbreak serogroup. Quadrivalent meningococcal conjugate vaccines (MCV4) provide long-term protection, starting 7-10 days after vaccination, against serogroups A, C, W, and Y and are routinely recommended for preteens at age 11-12 years with a booster at 16-18 years of age. In addition, two serogroup B (MenB) vaccines are now available in a 2 or 3 dose series. Please contact CDPH if mass vaccination is being considered.

Risk Communication
Immediately contact administrators of schools or other institutions where a case of meningococcal disease has occurred. Recommend that affected schools and institutions rapidly communicate (phone trees, e-mail) with their populations and help guide messaging.

Information communicated should include:

- Notification about the case (obtain consent if the name of the case is to be released).
- Reassurance that chance of another case is remote.
- Signs and symptoms of meningococcal disease and instructions to seek care promptly if they occur.
- Persons recommended to receive chemoprophylaxis will be notified by public health authorities.
- Serogroup specific vaccination recommendations.

Molecular subtyping of isolates
Molecular subtyping can be performed on isolates of the same serogroup to determine if they have similar genetic fingerprints. This information can be extremely helpful in determining if a cluster or outbreak is occurring.

***N. meningitidis* infection in a non-sterile site**
Although not recommended by CDC, CDPH considers it reasonable to manage close contacts of meningococcal conjunctivitis or pneumonia cases in the same manner as close contacts of invasive disease cases.
Invasive disease has developed among close contacts of meningococcal conjunctivitis or pneumonia cases.

Reporting
Report all suspected, probable and confirmed cases of meningococcal disease on CDPH form 8469 at: http://www.cdph.ca.gov/pubsforms/forms/Pages/CD-Report-Forms.aspx

Contact the CDPH Immunization Branch at (510) 620-3737 if there are ≥2 suspected cases in the same institution or social network, or for guidance about other unusual situations.

Recommended chemoprophylaxis regimens*

Age	Dose	Duration	Efficacy	Cautions
Rifampin[a]				
<1 month	5 mg/kg, orally, every 12 h	2 days		
≥1 month	10 mg/kg (maximum 600 mg), orally, every 12 h	2 days	90–95%	Can interfere with efficacy of oral contraceptives and some seizure and anticoagulant medications; can stain soft contact lenses.
Ceftriaxone				
<15 year	125 mg, intramuscularly	Single dose	90–95%	To decrease pain at injection site, dilute with 1% lidocaine.
≥15 year	250 mg, intramuscularly	Single dose	90–95%	To decrease pain at injection site, dilute with 1% lidocaine.
Ciprofloxacin[a,b]				
≥1 month	20 mg/kg (maximum 500 mg), orally	Single dose	90–95%	Per the 2015 AAP Red Book recommendations, ciprofloxacin is recommended as chemoprophylaxis for nonpregnant persons ≥1 month of age. Reports of adverse events in children have been rare after widespread ciprofloxacin use in children.
Azithromycin	10 mg/kg (maximum 500 mg)	Single dose	90%	Not recommended routinely; equivalent to rifampin for eradication of *Neisseria meningitidis* from nasopharynx in one study.

***Penicillin** is often appropriate as treatment, but is not appropriate for prophylaxis.
[a] Not recommended for use in pregnant women.
[b] Use only if fluoroquinolone-resistant strains of *N meningitidis* have not been identified in the community. See: CDC. Emergence of fluoroquinolone-resistant *Neisseria meningitidis*—Minnesota and North Dakota, 2007–2008. *MMWR*. 2008;57(7):173–175 at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5707a2.htm. In limited testing to date, ciprofloxacin-resistant *N. meningitidis* isolates have been detected in one case in California and three cases in the Midwest.